

CLAIMS

1. A multi-contact connector for coupling a plug to a socket silo comprising:
at least one socket operable to receive the plug, socket silo and a rolling latch on the plug, the socket having latching features operable to hold the plug within the socket.

2. The multi-contact connector according to claim 1, wherein the latching features comprise of a plurality of pawl receiving chambers, each pawl receiving chamber being sized to receive a pawl disposed on a latch on the plug.

3. The multi-contact connector according to claim 2, wherein each pawl receiving chamber further comprises an angled receiving wall operable to engage a surface on the pawl when the plug is coupled to the socket, the slope of the angled wall being proportionate to the pullout force required to withdraw the pawl from the receiving chamber and decouple the plug from the socket.

4. The multi-contact connector according to claim 1, wherein the socket includes a curved upper opening shaped and sized to receive the plug and latches disposed on the plug when the latches are in a retraced position.

5. The multi-contact connector according to claim 1, wherein the multi-contact connector is fabricated from heavy gage plastic.

6. The multi-contact connector according to claim 1, wherein the socket includes one or more positive keyways configured to fit within one or more corresponding negative keyways on a plug to be coupled with the socket.

7. The multi-contact connector according to claim 1, further comprising a plurality of locking legs disposed on the connector, wherein each leg includes an anchor pawl operable to secure the leg to an opening in a circuit board.

8. An electrical plug comprising:
a plug fuselage having opposing first and second ends, wherein the second end includes a beveled face surrounded by a sheath; and
at least one electrically conductive pin extending from the first end to the second end, the pin extending beyond the beveled face.

9. The electrical plug according to claim 8, wherein an inside surface of the sheath defines a trapezoidal space.

10. The electrical plug according to claim 8, wherein an outer end of the sheath extends beyond the end of at least one electrically conductive pin extending beyond the beveled face.

11. The electrical plug according to claim 8, wherein the beveled face is configured to mate with a socket silo having a corresponding beveled outer receiving surface.

12. The electrical plug according to claim 8, wherein an outside surface of the sheath includes one or more negative keyways.

13. The electrical plug according to claim 8, wherein the plug comprises a pin holder portion and a latch holder portion.

14. The electrical plug according to claim 8, further comprising rolling latches disposed on the plug along a longitudinal axis of the fuselage of the plug.

15. The electrical plug according to claim 14, wherein the rolling latches are disposed above a centerline of a thickness of the plug fuselage.

16. The electrical plug according to claim 14, wherein an inside surface of the sheath defines a trapezoidal space.

17. The electrical plug according to claim 14, wherein the beveled face is configured to mate with socket silos having corresponding beveled outer receiving surfaces.

18. The electrical plug according to claim 14, wherein an outside surface of the sheath includes one or more negative keyways.

19. The electrical plug according to claim 14, wherein the plug comprises a pin holder portion and a latch holder portion.

20. A socket silo for electrically coupling an electrical plug to a circuit board comprising:

a tower having an outer receiving surface, the outer receiving surface including at least one socket for receiving a conductive pin, the tower being affixed to a top surface of a support shelf;

at least one leg disposed on a bottom surface of the support shelf;

an open gallery created by the intersection of the bottom surface of the support shelf and the at least one leg, the open gallery being operable to hold a planar filter array; and

a conductor disposed on the inside of the socket extending from a distance at least four millimeters below the outer receiving surface to beyond the bottom surface of the support shelf.

21. The socket silo according to claim 20, wherein the open gallery is formed by the intersection of two legs with the bottom surface of the support shelf.

22. The socket silo according to claim 20, wherein the outer receiving surface is beveled.

23. The socket silo according to claim 20, wherein the tower has a trapezoidal cross-section.

24. The socket silo according to claim 20, wherein the planar filter array is ferrite through which the conductor passes.

25. The socket silo according to claim 20, wherein the planar filter array is a collection of capacitors through which the conductor passes.

26. A socket silo for electrically coupling an electrical plug to a circuit board comprising:

a tower having a beveled outer receiving surface, the beveled outer receiving surface including at least one socket for receiving a conductive pin; and

an electrical conductor disposed on an inside of the socket, the electrical conductor being operable to be electrically coupled with the conductive pin.

27. The socket silo according to claim 26, further comprising:
a support shelf on which the tower is disposed;

at least one leg disposed on a bottom surface of the support shelf;
an open gallery created by the intersection of the bottom surface of the support shelf and the at least one leg, the open gallery being operable to hold a planar filter array; and
the electrical conductor disposed on the inside of the socket extending from a distance of at least four millimeters below the outer receiving surface to beyond the bottom surface of the support shelf.

28. The socket silo according to claim 27, wherein the open gallery is formed by the intersection of two legs with the bottom surface of the support shelf.

29. The socket silo according to claim 27, wherein the planar filter array is ferrite through which the conductor passes.

30. The socket silo according to claim 27, wherein the planar filter array is a collection of capacitors through which the conductor passes.

31. The socket silo according to claim 26, wherein the tower has a trapezoidal cross-section.

32. The socket silo according to claim 26, wherein the beveled outer receiving surface on the tower is configured to mate snugly with a beveled face disposed on the plug.

33. The socket silo according to claim 26, wherein the beveled outer receiving surface of the tower comprises a crown operable to prevent the electrical coupling of the electrical conductor and a pin disposed on a plug not having a beveled face.

34. The socket silo according to claim 26, wherein the tower has a color corresponding to a color on a plug which may be used with the silo.

35. A latch operable to secure an electrical plug to a socket comprising:
a latch arm partially disposed on a hinged section on the outer surface of the plug, the latch arm having a free standing cantilever section ending in a pawl, the latch arm extending longitudinally along a fuselage of the plug;
a recessed section on an inside of the plug fuselage into which the hinged section and the entire latch may rotate from an extended to a retracted position.

36. The latch according to claim 35, wherein the free standing cantilever section and pawl are fully supported by a support shelf running along a longitudinal axis of the fuselage of the plug projecting from the outer surface of the plug in towards the inside of the plug.

37. The latch according to claim 36, wherein the hinged section is disposed on a pin holder portion and the support shelf is disposed on a latch holder portion of the plug.

38. The latch according to claim 35, wherein the pawl lies entirely within the recessed portion when the latch is in a retracted position.

39. The latch according to claim 35, wherein the latch is disposed above a centerline running longitudinally along the fuselage.

40. The latch according to claim 35, wherein the pawl comprises a cambered surface on an outer surface of the pawl such that the cambered surface is substantially parallel to the outer surface of the plug when the latch is in a recessed position.

41. The latch according to claim 35, wherein the pawl comprises a sloping receiving surface and a locking portion operable to hold the pawl firmly against a locking surface in a socket.

42. The latch according to claim 41, wherein the locking portion is angled to customize a pullout force required to withdraw the plug from the socket.

43. The latch according to claim 41, wherein the locking surface in the socket is angled to customize a pullout force required to withdraw the plug from the socket.

44. A socket for supporting an electrical plug coupled to a socket silo comprising:

an inner surface operable to accept an outer surface of the plug when latches on the plug are in an at least partially retracted insertion position;

a plurality of locking features on the inner surface of the socket operable to allow the latches to rebound away from the insertion position towards an extended position; and

a locking surface disposed in at least one of the locking features, the locking surface being in contact with a corresponding locking portion on the pawl, the friction between the locking surface and the locking portion being used to restrict the pawl from exiting the locking feature, the locking surface being angled to customize a pullout force required to withdraw the plug from the socket.

45. The socket according to claim 44, further comprising a positive keyway on the inner surface of the socket configured to fit within select negative keyways found on plugs attached to devices compatible for use with a silo disposed in an inner space surrounded by the inner surface of the socket.

46. The socket according to claim 44, wherein an end portion of the electrical plug is color-coded to match the color of a silo disposed in an inner space surrounded by the inner surface of the socket.

47. The socket according to claim 44, wherein an underside of the socket rests on a support shelf of a silo disposed in an inner space surrounded by the inner surface of the socket.

48. A method for inserting an electrical plug into a socket containing a socket silo comprising:

aligning an inner space formed by a sheath on a receiving end of the plug with a tower on the socket silo;

moving the plug relative to the tower such that the tower moves into the inner space;

pressing at least one conductive pin extending from a beveled surface formed on the plug in the inner space into a socket formed in a corresponding beveled interface surface on the tower; and

applying force to the plug and socket to allow the beveled surfaces to align and mate.

49. The method for inserting an electrical plug into a socket containing a socket silo of claim 48 wherein aligning an inner space formed by a sheath on a receiving end of the plug with a tower on the socket silo further comprises aligning a positive keyway on the socket with a negative keyway on the plug.

50. The method for inserting an electrical plug into a socket containing a socket silo of claim 48 wherein aligning an inner space formed by a sheath on a receiving end of the plug with a tower on the socket silo further comprises aligning a color-coded sheath on the plug with a like colored tower.

51. The method for inserting an electrical plug into a socket containing a socket silo of claim 48 further comprising applying sufficient force to the plug and socket such

that an upper surface on the socket imparts sufficient force to a receiving surface on a pawl attached to a latch on the plug, that the pawl and latch hinge toward an inner space of the plug about an axis parallel to the direction of insertion of the plug into the socket until a receiving chamber in the socket is encountered by the pawl wherein the latch snaps back toward an extended position and the pawl contacts and is retained by a wall of the receiving chamber.

52. The method for inserting an electrical plug into a socket containing a socket silo of claim 48 further comprising:

applying sufficient force to an upper body of a latch disposed on the plug such that the latch and a pawl disposed on an end thereof hinge toward an inner space of the plug about an axis parallel to the direction of insertion of the plug into the socket such that the plug can be inserted into the socket without being resisted by the pawl or the latch; and

releasing the force on the upper body of the latch once the pawl encounters a receiving chamber in the socket such that the latch snaps back toward an extended position and the pawl contacts and is retained by a wall of the receiving chamber.

53. A method for decoupling an electrical plug from a socket silo contained within a socket comprising:

moving the plug relative to a tower of the silo such that the plug moves away from a support shelf of the silo on which the tower is disposed;

pulling the plug away from the tower such that a beveled surface formed on the plug in an inner space of the plug decouples from a corresponding beveled interface surface on the tower; and

disengaging at least one conductive pin extending from the beveled surface on the plug from a socket formed in the interface surface.

54. The method for decoupling an electrical plug from a socket silo contained within a socket of claim 53 wherein moving the plug relative to a tower of the silo such that the

plug moves away from a support shelf of the silo on which the tower is disposed comprises moving the plug along a positive keyway formed on the socket.

55. The method for decoupling an electrical plug from a socket silo contained within a socket of claim 53 further comprising applying sufficient force to the plug and socket such that an angled receiving wall on the socket imparts sufficient force to a pullout face on a pawl attached to a latch on the plug, that the pawl and latch hinge toward an inner space of the plug about an axis parallel to the direction of decoupling of the plug from the socket until the pawl recedes far enough into the inner space such that it does not contact the socket to impede the withdrawal of the plug from the socket.

56. The method for decoupling an electrical plug from a socket silo contained within a socket of claim 53 further comprising:

applying sufficient force to an upper body of a latch disposed on the plug such that the latch and a pawl disposed on an end thereof hinge toward an inner space of the plug about an axis parallel to the direction of decoupling of the plug from the socket such that the plug can be withdrawn from the socket without being resisted by contact between the socket and either the pawl or the latch; and

releasing the force on the upper body of the latch once the pawl clears an upper surface of the socket such that the latch snaps back toward an extended position.